CS – 20 NETWORK TECHNOLOGY AND ADMINISTRATION

Objectives:

- Build an understanding of the fundamental concepts of computer networking.
- Familiarize with the basic taxonomy and terminology of the computer networking area and advanced networking.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

Prerequisites:

- Basic knowledge of computer networking.

No	Topics	Details

1	**Basics of Network, Network Models and LAN Sharing**	• Network concepts
		  ○ What is network?
		  ○ Use of network
		• Network model: peer – to – peer, client – server
		• Network Services
		  ○ File service,
		  ○ Print service,
		  ○ Comm. service,
		  ○ Data base service,
		  ○ Security service,
		  ○ Application service
		• Network Access Methods
		  ○ CSMA / CD,
		  ○ CSMA / CA,
		  ○ Token passing,
		  ○ Polling
		• Network Topologies: Bus, Ring, Star, Mesh, Tree, Hybrid
		• Advanced Network Topologies Ethernet, CDDI, FDDI
		• Communication Methods
		  ○ Unicasting,
		  ○ Multicasting,
		  ○ Broadcasting
		• OSI reference model with 7 layers
		• TCP/IP network model with 4 layers

2	**Transmission Media Multiplexing & Switching Concepts Network devices**	• Transmission Media
		  ○ Types of Transmission media
		  ○ Guided media
		  ○ Co – Axial Cable, Twisted Pair Cable,
		  ○ Crimping of Twisted pair cable, Fiber Optic Cable
		• Unguided media
		  ○ Infrared, Laser, Radio, Microwave, Bluetooth tech.

		• Different Frequency Ranges
		• Multiplexing & De-multiplexing
		• Multiplexing Types
		  ○ FDM,
		  ○ TDM,
		  ○ CDM,
		  ○ WDM
		• Switching Tech.
		  ○ Circuit Switching,
		  ○ Message Switching,
		  ○ Packet Switching
		• CABLE NETWORK DEVICES
		• LAYER1 DEVICES
		  ○ LAN CARD,
		  ○ MODEM,
		  ○ DSL & ADSL
		  ○ HUB(Active, Passive, Smart hub), REPEATER
		• LAYER2 DEVICES
		  ○ SWITCH(Manageable, non- manageable)
		  ○ BRIDGE(Source route, Transactional)
		• LAYER3 DEVICES
		  ○ ROUTER,
		  ○ LAYER3 SWITCH
		  ○ BROUTER,
		  ○ GATEWAY,
		  ○ Network Printer
		• WIRELESS NETWORK DEVICES
		  ○ Wireless switch,
		  ○ Wireless router,
		• ACCESSPOINT

3	**Network Protocols and IP Addressing**	• Packets &Protocols
		• Conn. Oriented protocols –TCP & connection less Protocols - UDP
		• TCP/IP STACK, HTTP, FTP, SMTP, POP3, SNMP,
		• TELNET, ARP, RARP, IPX/SPX, AppleTalk,
		• NetBIOS Name PROTOCOL
		• L2CAP, RFCOMM Protocol
		• What is ip address?
		• Types of ip address
		• ipv4
		  ○ Class structure, subneting, super netting
		• ipv6
		  ○ Basic structure of ipv6

		○ Implementation of ipv6 • Migration from ipv4 to ipv6

Seminar - 5 Lectures
Expert Talk - 5 Lectures
Test - 5 Lectures

Total Lectures 30 + 15 = 45

Reference Books:

- Networking Essential - Glenn Berg Tech. Media
- MCSE Self-Paced Training Kit (Server 2003) Data Communication and Networking - B A Forouzan
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Course outcomes:

- Understand various types of computer networks
- Enumerate the layers of the OSI model and TCP/IP
- Understand principles of LAN design such as topology and configuration
- Apply transmission media and various networking devices to establish networks
- Compare and Analyze various spread spectrum and multiplexing techniques
- Understand network industry trends such as: Routing Protocols, IP Addresses, Error Detection